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The
HOME PRODUCTION
OF ONION SEED
AND SETS



MOST of the onion seed used in this country is produced by special growers. However, by growing his own seed the onion grower can secure strains better adapted to his particular conditions than by using seed bought on the general market. The grower can select a few bushels of mother bulbs from his entire crop, thus enabling him to save seed from choice specimens, while the commercial seed grower uses almost the entire crop for seed production.

The mother bulbs must be carefully stored so they will go through the winter without deterioration. Unless the grower has suitable storage it is best to secure seed from some one who has all the necessary facilities.

Some sections of the country are not well adapted to the growing of onion seed, owing to soil and climatic conditions. In these sections it is best to buy the seed from reputable growers.

The production of onion sets is not so difficult as the production of seed, as sets are grown in very much the same way as onions for market except that the seed is sown more thickly.

This bulletin gives directions for the growing of both seed and sets, with special reference to the market gardener and truck farmer rather than the seed grower.

THE HOME PRODUCTION OF ONION SEED AND SETS¹

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MANY of the leading onion growers of the Northern States are raising their own supplies of seed, and by so doing they procure a better grade than is obtainable in the general market. During the early history of onion-seed growing in this country the crop was practically all produced in small plantings. Later, the production of seed fell into the hands of a few large, speculative growers. During recent years there has been a tendency to return to former conditions.

Formerly the supply of onion seed came from farmers who selected seed bulbs of a uniform type year after year and in so doing established a definite strain; these bulbs were chosen from the entire crop of marketable onions, which permitted the selection of enough bulbs of the type desired for seed. In so doing the farmers were practicing selection, all bulbs not conforming to the desired type being discarded. In commercial onion-seed growing, where the bulbs are grown exclusively for seed purposes, it would not be profitable to

discard all those that do not conform to the desired type.

It is customary for growers to select very carefully the few mother bulbs necessary to produce stock seed from which to grow their commercial crop of seed. In cases where commercial seed growers are short of bulbs for seed purposes, they frequently go into the market and purchase the best obtainable to make up the deficiency. Where a farmer is producing three or four thousand bushels of onions for the market from pedigree seed, it will be a comparatively easy matter for him to select from that quantity two or three hundred bushels of extra fine bulbs of the type desired for seed. Onion seed produced in this manner from selected bulbs and costing \$1.50 a pound will in the end be cheaper than seed at 40 cents a pound that has come from a miscellaneous lot of bulbs taken as they run, without selection.

Unfortunately, the home production of onion seed is now more or less dependent upon the market price of onions the previous season. Many

¹ For the culture of onions for the general market, see Farmers' Bulletin No. 354, entitled "Onion Culture," which will be sent free on application to the Secretary of Agriculture.

growers plant for seed only when they have failed to sell their crop, thus giving uncertainty and irregularity to the enterprise. There are a few farmers who plant a fairly uniform quantity of bulbs for seed each year, and who are making a decided success of the work.

Certain growers are better equipped than are others for the growing and handling of the seed and thus are in position to supply seed for the entire community. It has been found that carefully grown seed planted in the same general locality in which it is produced will give better results than seed brought from a distance; this is especially true in northern localities, where the season of growth is short, as southern-grown seed requires a longer season for its maturity.

The production of onion sets has been confined to a few localities. Now, however, the industry is receiving more general attention. Sets may be produced under a reasonably wide range of conditions, but in order to be successful it is essential that the grower should fully understand the principles and methods involved. The production of onion seed and sets is an important phase of the general onion industry, but owing to its more local nature it is treated separately.

HOME PRODUCTION OF ONION SEED

SELECTION AND CARE OF BULBS FOR SEED

The bulbs, or "mother bulbs," as they are commonly called, for the production of onion seed should be grown in the same manner as those intended for marketing, except that more care should be taken throughout. Some seed growers prefer to use 6 pounds of seed to an acre for the production of seed bulbs instead of 4 pounds, as ordinarily used in growing for market, in order that the bulbs may crowd and not become too large. The planting, culture, and harvesting of the bulbs are practically the same as for first-class marketable stock.

Onion-seed growing is a two-year process and two crops are constantly to be cared for. After growing the bulbs the first summer they must be stored over winter and replanted the following spring for the production of seed. Meantime the crop for the next year's planting must be coming

on in order to have a crop of seed every year.

Onion seed can not be grown profitably in all parts of the country, for various reasons. Proper soil conditions are essential; also a climate that is free from extremes of temperature and rainfall. Certain localities in the Northeastern States near the ocean, around the Great Lakes, and on the Pacific coast are especially adapted to the production of onion seed.

The first requisite for the growing of the best seed is a clear-cut ideal of the exact shape, form, color, and general characteristics sought in the variety being grown. The second requisite is the growing of seed from bulbs of that exact type for the greatest possible number of generations.

Two selections should be made, the first to include but a small number of the very finest and most ideal bulbs from which to produce the stock seed to be used the following year for the growing of the seed bulbs, and the second to include the bulbs from which to grow the supply of seed for the market. By keeping the very best stock separate and using the product for propagation, the entire strain will be gradually improved. Bulbs a trifle below the ideal market size, or about $1\frac{1}{2}$ to 2 inches in diameter, are the most profitable for seed production.

CARE OF BULBS DURING WINTER

Bulbs that are to be used for seed production should be allowed to become thoroughly ripe in the field. After pulling they should be stored in crates under a roof where they will have plenty of ventilation and be protected from sun and rain. Before freezing weather begins the onions should be graded and removed to a house where both ventilation and temperature can be controlled.

The temperature of the room in which the mother bulbs are stored should be kept as low as practicable under natural conditions without actual freezing. Onions freeze at a temperature of about 30.3° F., so a temperature a little above 30° will do no harm. Plenty of ventilation should also be provided for the storage room. Heat and moisture in the storage room will cause the onions to sprout during the storage period and render them almost worthless for seed purposes. In general, the storage conditions should be the same as for onions intended for the market.

SOILS ADAPTED TO THE GROWING OF SEED

Two types of soil may be used to advantage in growing onion seed. The soil upon which the bulbs are grown from seed should be quite rich and well supplied with organic matter and moisture. Good, rich sandy loam is best adapted to the growing of the bulbs. For the production of seed from bulbs, a soil that is well drained, fertile, and of a loamy nature is desirable. It is customary to grow the bulbs the first season on rich bottom land and to grow the seed the second season on well-drained upland. Soils containing an abundance of lime, such

a rate not exceeding 1,000 pounds to the acre.

PREPARATION OF THE SOIL AND PLANTING

In preparing the land for setting the bulbs, apply the fertilizer and reduce the soil to a good state of tilth. Then mark off the land in rows about $2\frac{1}{2}$ to $3\frac{1}{2}$ feet apart by means of a one-horse plow, a corn marker, or some tool that will leave a decided furrow in which to set the bulbs. In some sections the rows are placed as close as 2 feet, but this hinders cultivation.

The bulbs should be placed by hand (fig. 1), root downward, from 3 to 6 inches apart, center to center,

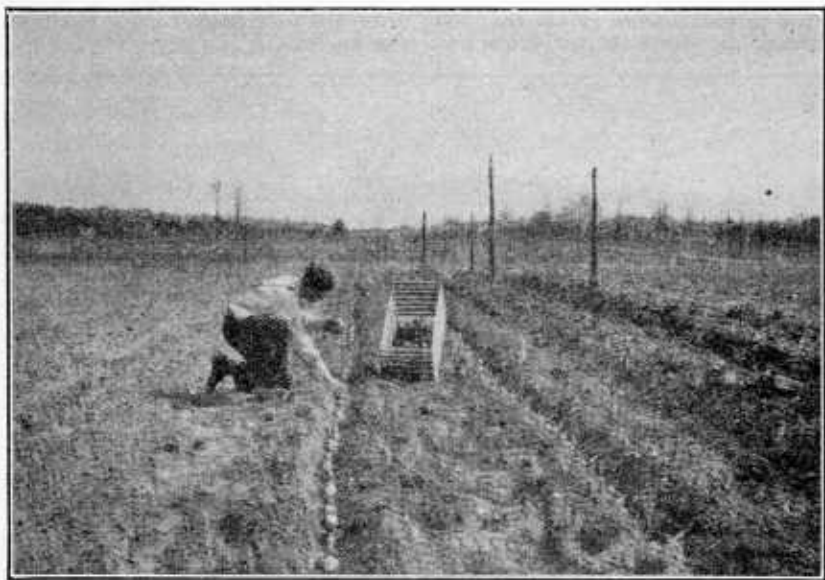


FIG. 1.—Method of setting out bulbs for seed production

as are suited to the successful production of wheat, are adapted to onion-seed growing. The soil should be free from weed seeds and in a good state of tilth.

The bulbs for seed growing should not be set in a soil containing large quantities of fresh stable manure or green vegetable matter, but rather in a soil where some cultivated crop, such as corn, has been grown the previous season. Commercial fertilizers containing a small percentage of nitrogen, 6 to 8 per cent of available phosphoric acid, and 6 to 8 per cent of potash can be used to advantage at

in the furrow. The usual rule is to set the bulbs so that the distance between them will be about equal to the diameter of the bulbs. The quantity of bulbs that may be set on an acre will depend largely upon their size, but may be as high as 250 bushels. Where the seed is to be employed for growing sets and overgrown sets are used as "mother" bulbs, the quantity required may be as low as 50 bushels to the acre. The bulbs should be placed in the ground sufficiently deep to be entirely below the surface of the soil when covered. As growth proceeds the soil should be drawn

around the bulbs to form a support for the seed stalks.

CULTIVATION

Shallow cultivation should be given throughout, the object being to keep the land free from weeds and the soil worked toward the plants. Very little handwork will be necessary, except, perhaps, to go through after the seed heads have formed, remove the weeds, and draw the soil around the plants to hold the stalks erect and prevent the seed heads from blowing down and coming in contact with the soil.

TIME AND MANNER OF GATHERING THE SEED

The proper time to gather the seed is when the inside of the grain has

harvesting, the heads are cut by hand, with 2 to 6 inches of the stem attached, and are placed in bags for transportation to the curing sheds.

CURING THE SEED HEADS

Any building having a tight floor and in which a free circulation of air can be maintained will serve as a curing place for onion seed. Many growers employ buildings similar to those used for curing tobacco, with the alternate vertical siding boards hinged so that they can be thrown open during good weather. In localities where rains do not occur during the curing period the seed heads are frequently dried on sheets of canvas stretched over frames or spread upon the ground.

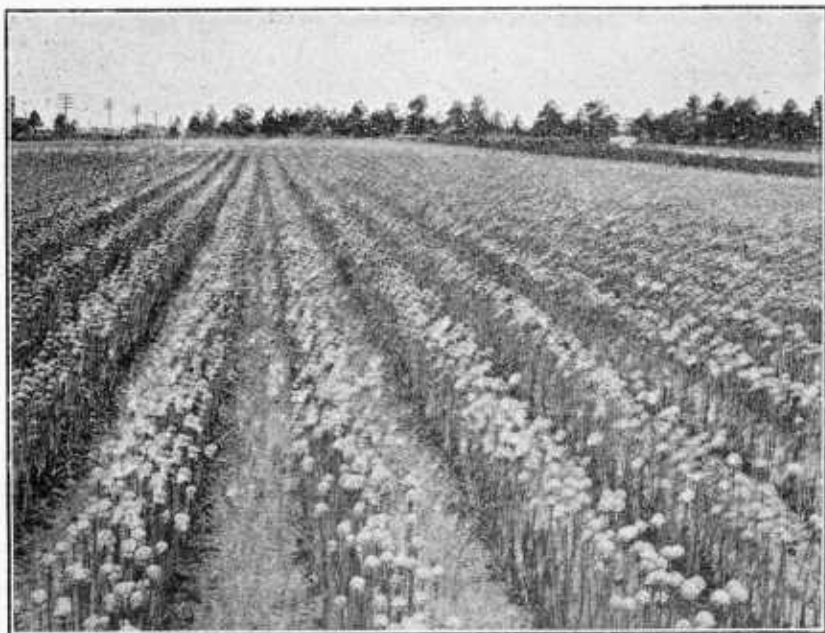


FIG. 2.—Field of onion seed a short time before harvesting

reached the dough stage. Onion seed assumes its black color very early; in fact, before it has passed the watery stage and formed milk in the grain. This change of color is no indication of ripeness and very often deceives the inexperienced grower. The heads should be harvested just before the first-formed seed begins to shatter in handling.

Figure 2 shows a field of onions a short time before the seed is ripe. In

For curing the seed in houses, wire-bottomed racks or trays placed one above the other are generally employed. As the seed is stirred from time to time during the curing process considerable of it will be shattered and fall upon the tray below or finally upon the floor. The main essentials in the curing of onion seed are to spread the heads very thinly, not over two heads in depth, and to give free ventilation. Even at a depth of

3 inches in the trays it will be necessary to stir them very often, especially during damp weather.

THRESHING AND CLEANING THE SEED

The date for gathering the seed depends upon the locality and climate, but as a rule this will be about mid-summer or not later than August 15. The threshing and cleaning of the seed are often deferred until quite late in the autumn, except where the curing is done in the open air. Where large quantities of seed are produced the threshing is done with machines similar to regular grain threshers, but when grown on a small scale the seed is removed by beating with a flail.

After the seed has been threshed, there is still considerable danger of its heating or molding if left in too great bulk. The usual practice is to run it through a fanning mill to remove the dust and small particles of the heads or chaff that are broken up in threshing. In former years the method of cleaning was to place the seed in a tank of water, the heavy seed settling to the bottom of the tank, while the chaff and lighter portions could be floated off. This process is no longer used to any great extent, owing to the improvement in cleaning machinery and the danger of injuring the seed by the water. After the seed is fanned and most of the foreign matter removed, it should be spread thinly on the floor or canvas and stirred from time to time. About the only test that can be applied in order to detect moisture in the seed is that of feeling it with the hand, and anyone experienced in the handling of seed will soon become expert at determining when it is safe to bag it ready for storage or shipment.

YIELD OF SEED TO AN ACRE

The quantity of onion seed that can be grown on an acre depends on several conditions. In the first place this will be determined largely by the size of the bulbs that are planted. In the onion-set districts, where the seed with which to produce the sets is locally grown from overgrown sets, the quantity of seed is generally from 6 to 8 pounds to the bushel of bulbs planted. This seed, however, is not suitable for the production of standard market onions, and can be used for set growing only. In the production of seed from standard mother bulbs the yield is generally from 2 to

3 pounds of seed for every bushel of bulbs planted. This has been much higher in many cases, but 2½ pounds is generally considered satisfactory. The yield of seed as a rule will be about 400 pounds to the acre, although as high as 800 or even 1,000 pounds have been secured.

The price per pound paid for the seed varies according to the quality, variety, and market demands. For first-class high-grade seed from specially selected bulbs of desirable types the growers frequently receive two or three times as much per pound as for the general crop produced from bulbs not specially selected, which must be sold in competition with the great mass of seed produced by large growers.

When the cost of growing the bulbs, together with the preparation of the land, the keeping of the bulbs over winter, the necessity of handling them a large number of times, and the occupying of the land for two seasons is considered, it will be readily seen there is not a great profit in growing onion seed. However, there are quite a number of farmers who each year plant 2 or 3 acres to bulbs for seed and have for sale anywhere from 1,000 to 1,500 pounds of very choice seed. In many cases this represents the money crop of the farm. The extent to which this enterprise could be conducted with profit is doubtless limited, but the demand for high-grade seed of a distinct type is increasing each year. Anyone contemplating the growing of onion seed should carefully study local conditions and then operate in a small way until the necessary practices are understood.

PRODUCTION OF SEED FOR ONION-SET GROWING

Frequently the seed for onion-set growing is produced from bulbs selected from the sets themselves; in other words, the bulbs or mother bulbs are the overgrown sets. Near Louisville, Ky., the onion-set growers select the oversized bulbs and store them over winter. In the spring they send them to farmers in the hill country and have their supply of seed grown on bluegrass land which has not been heavily manured. In this way they are able to keep their onion seed free from disease and secure a higher vitality than if the seed were grown on the same land where the bulbs were produced.

Owing to the great quantity of seed employed in set growing it is desirable to secure it cheaply, and the bulbs

selected from the sets, being small, will produce a larger quantity of seed per bushel from mother bulbs than when grown in the usual manner. The stock seed bulbs should, however, be well matured, small necked, uniform in size, and selected according to an ideal shape. Onion seed from undersized bulbs is not so desirable, even for set growing, as that from standard bulbs.

After a crop of onion seed has been gathered it is the usual custom to plow up the bulbs and devote the land to some other crop. If the old bulbs are allowed to remain in the soil through the winter, especially if given slight protection, they will produce a small crop of seed the second season. This practice is not recommended except under special conditions where the land is not valuable or where it is particularly desirable to secure an additional quantity of seed from the bulbs.

CARE OF ONION SEED

The length of time that onion seed will retain its vitality depends largely upon maturity and climatic conditions. Well-matured seed will always keep better than poorly ripened and inferior seed. Under ordinary conditions onion seed loses its vitality very rapidly after the second year, especially if stored in a damp climate. It will often pay to ship the seed to a dry climate for storage.

PRODUCTION OF ONION SETS

CLIMATE AND SOILS ADAPTED TO ONION-SET GROWING

The term "set," as applied to the onion, indicates a small, undersized bulb which, when replanted in the ground, will produce a large onion. This method of producing onions is perhaps the oldest and now the most universally employed for the growing of small areas of onions in the garden and where an early crop is desired. The common method of producing sets is to plant a large quantity of seed on a small area of rather rich land and thus produce a great number of bulbs that are undersized, owing to crowding and lack of plant food. The greater number of these bulbs do not attain sufficient size or maturity to produce seed the following season and are really plants in which the process of growth has been arrested.

In the United States the onion-set industry is largely confined to a few

areas. The crop is extensively grown near Louisville, Ky., Chillicothe, Ohio, and Chicago, Ill., in the Platte River Valley of Nebraska, in southwestern New Jersey, and in southern California. The entire area devoted to this enterprise in these localities is estimated at from 2,500 to 3,000 acres. The yield to the acre varies with the locality, but will average about 300 bushels. The market for onion sets is found throughout the entire country, the greater portion being disposed of in small quantities.

The climatic conditions governing the production of onion sets are practically the same as those for standard onions, although it is not necessary to plant quite so early in the spring. Onion sets can undoubtedly be grown in any part of the Northern States where suitable soil conditions can be obtained. The soil adapted to onion-set culture is as a rule about the same as that required for the growing of large onions, except that the land should not be so rich.

In the Louisville district the soil is a clay loam, containing plenty of lime. This soil, by the use of fertilizer, will yield 250 to 350 bushels of mature onions and will produce an equal quantity of sets, but the fertilizer requirements for the latter are not so great. This land is underlain at a depth varying from 18 inches to 10 or 12 feet by limestone and is a natural bluegrass soil, retentive of moisture, and comparatively free from weeds.

In the vicinity of Chillicothe, Ohio, the soil is a river-bottom loam, being principally the washings from the hills. This soil contains occasional small beds of gravel, but owing to its silty nature it is retentive of moisture and easily cultivated.

In the Chicago area we find a variation in soil texture. In the vicinity of South Chicago the area devoted to onion-set growing was formerly a sewage-disposal farm and is laid off in regular level beds. This soil is of a sandy, loamy nature and is very similar to the river-bottom lands at Chillicothe. Northwest of Chicago the soil is a more gravelly loam, although in some places it is of a river-bottom or silty nature.

In southwestern New Jersey the soil is a sandy loam, not unlike the Norfolk sandy loam, although it contains more or less gravel, and in places the clay approaches the surface.

It will be seen that onion sets can be grown on any land that is adapted

to general truck crops, the main essential being freedom from weeds and a reasonably high state of tillage.

PREPARATION OF THE SOIL

In preparing the land for onion-set growing the work should be performed in practically the same manner as for regular crops of onions. The plowing need be only moderately deep, but the soil must be brought to a smooth, fine surface, suitable for the proper sowing of the seed by means of hand drills. The tools generally employed for this purpose are the plow, disk harrow, roller, smoothing harrow, and sometimes a pull or drag made of scantlings or planks. A harrow of the type shown in Figure 3 is adapted to the final preparation before planting.

On some land onion sets have been grown continuously year after year without any appreciably injurious results. In other localities it has been found necessary to adopt a crop-rotation system, and this is advisable wherever the quantity of available

SOWING THE SEED

As the essential feature of growing onion sets is the crowding together of the plants in the rows, a large quantity of seed is required to plant an acre. The quantity of seed required varies with the different localities. In the vicinity of Louisville, Ky., from 55 to 60 pounds to the acre are sown; Chillicothe, Ohio, 40 to 50 pounds; Chicago, 55 to 120 pounds; while in New Jersey as low as 25 pounds to the acre are used.

The drills employed for seeding are, as a rule, the hand seeders usually found upon the market used for sowing the seed of all small truck crops. In some localities, however, special seeders have been designed in order to distribute the seed in a particular manner. Near Chillicothe, Ohio, many of the growers employ a drill having five small teeth similar to the shoes of an ordinary grain drill, but on a very small scale. (See fig. 4.)

These seeders distribute the seed in five little drills about an inch apart,

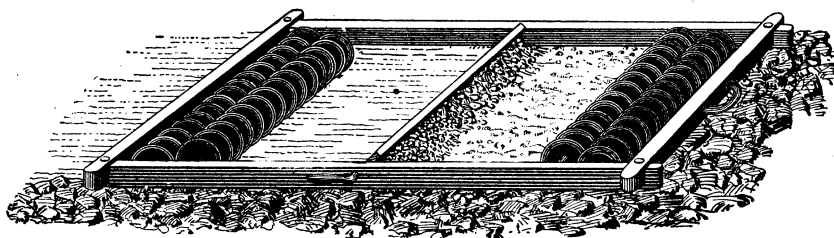


FIG. 3.—Harrow for leveling soil for planting seed

land is sufficient. A rotation including corn, potatoes, onion sets, and clover will be found quite satisfactory.

FERTILIZERS

In preparing the land for growing onion sets large quantities of barnyard manure should not be applied immediately before planting. If barnyard manure is to be employed, it should be used the previous season on some other crop, in order that it may become fully incorporated with the soil and in a measure subdued. Commercial fertilizers may be employed profitably in moderate quantities, say 600 to 1,200 pounds to the acre, and should be broadcasted at the time of fitting the land. This fertilizer should contain about 4 or 5 per cent of nitrogen, 6 or 8 per cent of available phosphoric acid, and 8 or 10 per cent of potash.

making a broad belt of five rows. Another method is to place a funnel-shaped spreader on the under part of the drill, which scatters the seed over an area of 3 or 4 inches in width.

DISTANCES TO PLANT AND QUANTITY OF SEED REQUIRED

The distance between the rows ranges from 7 to 14 inches, but varies with the method of sowing. The larger yields are obtained by sowing in single drills about 9 inches between the rows and using 65 to 85 pounds of seed to the acre. Most growers endeavor to sow their onion seed as early as the land can be put in first-class condition. Formerly the seeds for sets were not sown until late in the season, but it has been found that larger yields of sets can be obtained and that the sets will ripen better if the seed is sown early.

The New Jersey growers have found it more profitable to grow a sort of mixed crop, including all sizes from sets to marketable onions. A smaller quantity of seed is employed per acre,

within six or eight days after planting. It is desirable that the soil should be stirred frequently and that the weeds should never be given an opportunity to gain a foothold. The

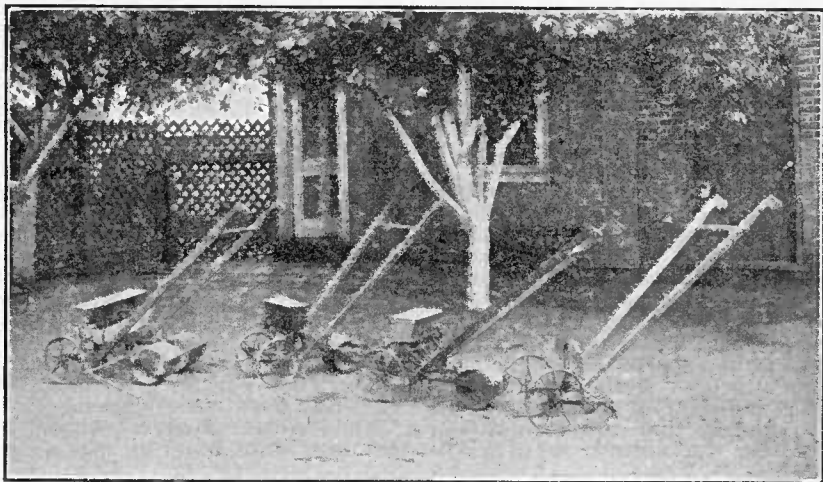


Fig. 4.—Special tools for planting and cultivating onion sets

but, on the other hand, the method of growing is somewhat different, and a larger percentage of overgrown bulbs is secured. Those that are below standard size are sold as "boilers" or "stewers," "picklers," and "sets." By using about 25 pounds of first-class seed to the acre and planting in rows 24 inches apart these growers are enabled to employ horse culture and succeed in growing about 300 bushels of all sizes to the acre. This method of planting does not

onion sets should be cultivated at least once every week during their growing period.

The tools employed are for the most part of the wheel-hoe type, of which there are a number of forms. These tools are provided with numerous attachments for cutting close to the plants, for throwing the soil away from the rows, and for leveling and working it back around them. Some of the Chicago growers have adopted a special wheel hoe of their own design, using the front wheel of a bicycle and a pair of light-weight plow handles for the frame, to which the various types of sweeps and shovels are attached. In New Jersey horse tools are employed almost exclusively, the 14 or 15 tooth harrow-type cultivator (fig. 5) being the favorite.

Hand weeding seems to be an essential in all localities, although this laborious process can be eliminated to some extent by proper wheel-hoe and horse cultivation. The cost of the cultivation of an acre of onion sets during the season should not exceed \$100, and this may be reduced considerably if the land is in proper condition and the work is handled at the right time. Hand weeding in most cases will be necessary twice during the growth of the crop. During rainy



Fig. 5.—One-horse cultivator of the harrow type

greatly decrease the yield and at the same time reduces the cost of cultivation.

CULTIVATION

As a rule onion seed will germinate and the plants appear above ground so that the rows can be followed

seasons it is often found impossible to keep certain areas clean, and when the weeds once become well established there is very little hope of saving the crop. When the sets have attained considerable growth the tops shade the ground and prevent, in a measure, the growth of weeds. After this stage has been reached very little attention will be required. In fact, the stirring of the soil should cease before the sets show any tendency to ripen. Figure 6 will give some idea of the appearance of an onion-set field at the period of its maximum development.

off by hand, and the bulbs sifted and placed upon trays to dry. These trays are piled one upon another in the field (fig. 8) with a space of 3 or 4 inches between and a temporary roof placed over them. They are allowed to remain upon these trays until quite dry and are again screened and removed to the storehouse.

Near Chillicothe, Ohio, the sets are pulled while yet quite green and stacked in the field in long, narrow ridges (figs. 9 and 10), the bulbs being placed underneath so that the tops will protect them from sunlight and rain. After remaining in these ridges



FIG. 6.—Hand weeding an onion-set field during early summer

HARVESTING AND CURING

The time for harvesting is just when the sets begin to ripen. This generally occurs about July 4 in southern localities and July 20 near Chicago, or 90 to 110 days from the date of sowing the seed. The methods of harvesting are different in the several localities. Near Louisville, Ky., the sets are allowed to become quite ripe before harvesting.

At harvest time the sets are loosened from the soil by means of a cutter attached to a wheel hoe or with broad forks having 10 or 12 tines. They are then pulled by hand, as shown in Figure 7, the tops twisted

about two weeks, the tops are twisted off and the bulbs placed upon screens to dry. From the screens they are hauled to the warehouse where the fanning and cleaning take place.

Near Chicago the practice of pulling is very similar to that in the vicinity of Louisville, the tops being twisted off as the sets are removed from the soil. In New Jersey the sets are allowed to become fully ripe before being removed from the soil and are harvested and cured together with the larger bulbs, after which they are separated by fanning and screening.

After pulling, it is essential that the sets be subjected to a drying process; during this process they require plenty

of ventilation. This can be most easily secured by spreading the sets on trays, commonly called crates, that are provided with corner pieces extending 4 or 5 inches above the sides of the

thus securing the best possible ventilation. In the absence of corner pieces blocks of wood or broken bricks are employed, as shown in Figure 8. A roof of boards is placed over each



FIG. 7.—Harvesting onion sets near Louisville, Ky.

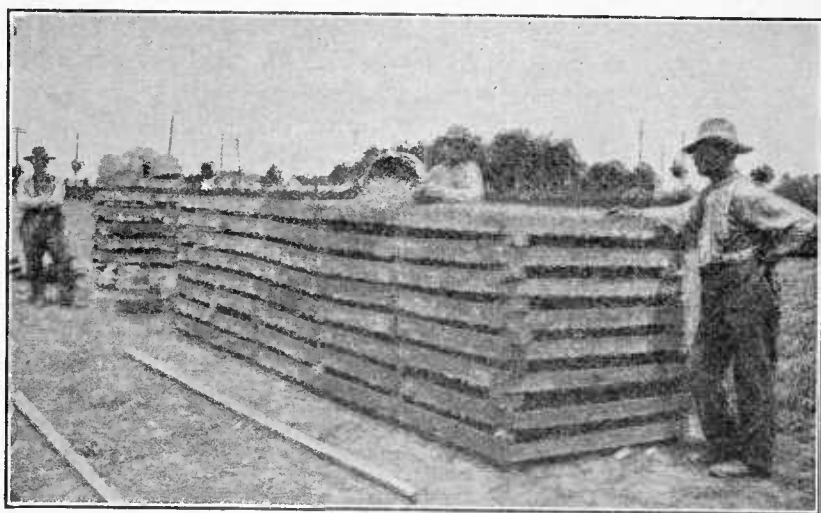


FIG. 8.—Onion sets drying on trays piled in a field.

trays. As a rule these trays are constructed with 3-inch sides, about 5 feet square, with slat or wire bottoms, and hold about 3 bushels of onion sets. When the trays are piled one upon another the corner pieces provide an air space above each tray,

stack of trays to protect the onion sets from the sun and rain.

STORING ONION SETS

The method of storage is essentially the same in all localities, the tray

previously described being most commonly used. (Fig. 11.) When the sets have become sufficiently dry some growers transfer them to the 1-bushel crates, in which they are shipped. Onion sets are stored under conditions similar to those required for large onions, the essentials being plenty of ventilation, dryness, and a comparatively low temperature. Slight freezing will not destroy them, provided they are not disturbed while frozen. However, freezing is always injurious and has a tendency to cause them to sprout earlier in the spring. If a uniform temperature 2 or 3 degrees above freezing can be maintained, it is more satisfactory than too frequent variation.

In preparing the sets for market they are first passed through a fanning mill, which removes all loose skins, earth, or shriveled bulbs, and then over a screen which removes any bulbs that are too large for the market demands. After this they are shipped in 1-bushel crates, burlap bags, or barrels.

The crate is perhaps most desirable as a shipping package, as it protects the bulbs and allows a free circulation of the air. When shipped in bags the sets are liable to become injured, except where they are handled in car-load lots. Tight barrels are objectionable unless the sets are thoroughly cured, as there is liability to heat in the center.



FIG. 9.—“Stacking” onion sets to cure in a field.

Some growers employ a form of open shed as a temporary storage place for the sets during the autumn months or until cold weather begins. A few growers store their crop until late winter and sell direct to seedsmen and dealers, but the majority turn their sets over to warehousemen for storage and disposal. Throughout the storage period the sets should be handled as little as possible and should be kept spread out thinly, so there will be no chance of heating. Onions in storage are constantly giving off more or less moisture and are liable to become damp and sprout if stored in too great bulk.

PROPER SIZE OF ONION SETS

The ideal onion set is almost globular in shape and a trifle less than half an inch in diameter. The illustration on the title-page shows a quart of first-class onion sets. The color should be bright and the surface free from smut or spots of any kind. The term “pickler” is applied to the onion just above sets in size, or, in other words, one-half to three-fourths of an inch in diameter. The term “boiler,” or “stewer,” is applied to the size next larger than picklers, or from three-fourths of an inch to $1\frac{1}{4}$ inches in diameter, which are too small for sale as standard onions.

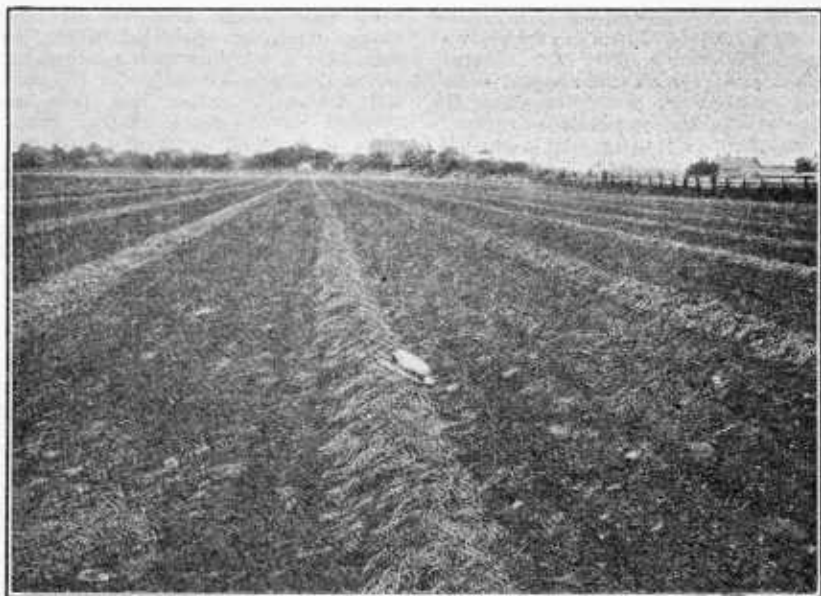


FIG. 10.—Onion sets curing in "stacks"



FIG. 11.—Onion sets stored on trays in a warehouse

Another type of bulblet sometimes sold for propagation is that of the "top" or "multiplier" onion. These bulblets are formed on the top of a stalk similar to a flower stalk and if planted will produce a fair-sized bulb. If the bulbs are allowed to remain in the soil they will throw up stalks the following season and produce bulblets for further planting. This variety is extensively used for the production of young onions which are peeled, bunched, and marketed during the early spring. The bulblets are planted closely, either in beds or in rows, during the late autumn, and the young onions will be ready for use early in the spring. In cold climates slight protection will be required in order to carry the planted bulbs safely through the winter.

VARIETIES OF ONIONS USED FOR SETS

Seed of almost any variety of onion may be used for the production of sets, but a greater demand exists for the distinctly yellow, white, and red colors. In the trade the sets are recognized by their color rather than by actual varietal names. The demand for the yellow and the white sets is greater than for the red, and those of the globular type are generally preferred.

Onion sets are sometimes grown from left-over seed, in which case a large number of varieties may be included. In the principal set-growing districts, where the seed has been locally grown for many years, the varieties are more or less distinct from those of seedsmen's catalogues.

ORGANIZATION OF THE UNITED STATES DEPARTMENT OF AGRICULTURE

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